

AMENDMENTS

I. IN THE SPECIFICATION:

Please replace ¶. 0007 with:

[0007] Current redundant-execution systems commonly employ a technique known as "lockstepping" that detects processor faults by running identical copies of the same program on two identical lockstepped (cycle-synchronized) processors. In each cycle, both processors are fed identical inputs and a checker circuit compares the outputs. On an output mismatch, the checker flags an error and can initiate a recovery sequence. Lockstepping can reduce processors silent data corruption failures in time (SDC FIT) by detecting each fault that manifests at the checker. Unfortunately, lockstepping wastes processor resources that could otherwise be used to improve performance.

Please replace ¶. 0033 with:

[0033] In a speculative multithreading (SMT) system, a sequential program is divided into logically sequential segments, referred to as epochs or tasks. Multiple epochs are executed in parallel, either on separate processor cores or as separate threads within an SMT processor. At any given point in time, only the oldest epoch corresponds to the execution of the original sequential program. The execution of all other epochs is based on speculating past potential control and data hazards. In the case of an inter-epoch misspeculation, the misspeculated epochs are squashed. If an epoch completes execution and becomes the oldest epoch, its results are committed to the sequential architectural state of the computation.

Please replace ¶. 0039 with:

[0039] Individual executions of a particular epoch is known as an epoch "instance". The two instances of epoch are executed in parallel by the leading thread 510 and the trailing thread 520 of the RMT (Redundant Multithreading) system. Once executed, the stores are sent to a memory system 540. The stores are kept in the memory system as speculative stores, using the speculative memory support described above. Once both instances of the epoch have completed, the exposed stores are compared 550. If the compared stores match, a single set of exposed stores is committed to the architectural memory state 560.